

IMPORTANT—This catalog
supersedes all previous
printings of the Owens-
Illinois section of Sweet's
Architectural Catalog and
all reprints from same cov-
ering Insulux Glass Block.

OWENS-ILLINOIS
Insulux
GLASS BLOCK
ADMITS LIGHT, RETARDS HEAT

A PRODUCT OF OWENS-ILLINOIS GLASS COMPANY, INDUSTRIAL AND STRUCTURAL PRODUCTS DIVISION, TOLEDO, OHIO

Light

THE MODERN WAY . . .



IN HOTELS
Shoreland Hotel
Chicago
James F. Eppenstein
Architect



IN HOSPITALS
St. Mary's Hospital
St. Louis
O'Meara & Hills
G. E. Quick
Associate, Architects



IN SCHOOLS
Tippecanoe School, Milwaukee
G. E. Wiley, Architect



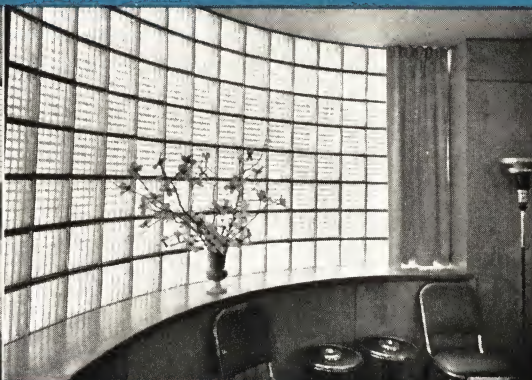
IN OFFICES
Office Building, Milwaukee
Edwin J. Kraus, Architect



IN HOMES
Residence in Benton Harbor, Mich.
Pasquale Iannelli, Architect



IN FACTORIES
Bauer & Black Plant, Chicago
Designed by own Engineering Department



IN THEATERS
Landis Theater, Vineland, N. J.
Wm. H. Lee, Architect



IN STORES
Weiboldt Department Store, Oak Park, Ill.
Holabird & Root, Architects

OWENS-ILLINOIS

Insulux A PRACTICAL BUILDING MATERIAL

USED TO TRANSMIT LIGHT... PROVIDE INSULATION... AND AID IN CREATING INTERESTING DESIGN

A HOLLOW GLASS BLOCK

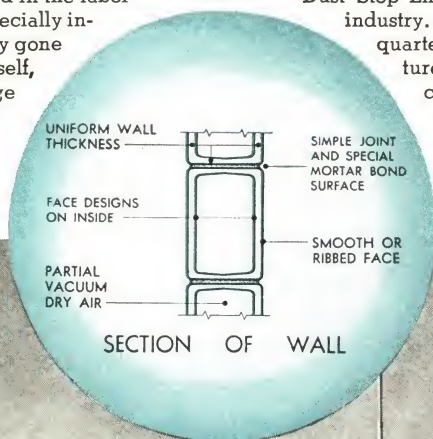
Owens-Illinois Insulux is a hollow, partially evacuated block made of water-clear pressed glass. It is hermetically sealed at the time of manufacture, and is finished on the mortar-bearing surfaces with a permanent, gritty mortar bond. This permits it to be laid up in mortar to create attractive, light-transmitting panels with high insulating value. It is translucent, but not transparent, and it is highly resistant to the transmission of sound.

SERVES MANY USES

These basic features have made it practical for use in virtually all types of construction. Industry uses it for its light transmission, insulation value and low maintenance. The home uses it as a new design element, as a source of greater light without undue heat loss, and as a means of obtaining privacy—from view and from noise. Commercial structures use it as a design element, and as a feature in interesting lighting effects to attract public patronage.

THE RESULT OF EXTENSIVE RESEARCH

Insulux is in its fifth year as a practical building unit. It is the object of extensive research both within the company and in the laboratories of outside agencies. Architects will be especially interested in knowing that this research has not only gone into the physical characteristics of the material itself, but also into its application and use under average conditions in the field. A part of this program has been a constant checking of panels, over a period of years, in representative installations



—panels in actual service under a variety of conditions, some subjected to conditions much more severe than standard specifications permit.

ERECTED BY MASON AND BRICKLAYER

It is this field experience with Insulux that has developed the standard method for erection of Glass Block. Insulux is laid up by the mason and bricklayer using a Portland-cement-lime-sand mortar. Thus, it is in the hands of one of the oldest and best established building trades.

SOLD BY DEALERS

Insulux Glass Block is sold by dealers. It is stocked in different sizes and designs to permit efficient delivery service in any quantity desired.

STOCKED IN ALL PRINCIPAL MARKETS

Insulux dealers have been established in every state in the union, and in all principal markets. Many hundreds of them, located to provide efficient coverage, constitute the Owens-Illinois Dealer organization. Each has a genuine interest in the success of Insulux and is ready to be helpful in any way he can to those who contemplate its use.

MANUFACTURED BY OWENS-ILLINOIS GLASS COMPANY

Insulux is manufactured by Owens-Illinois Glass Company, manufacturers also of Fiberglas Insulation, Fiberglas Power Products, Red Top Insulating Wool, Dust-Stop Replacement-Type Air Filters, and Dust-Stop Enclosed Units for the building and construction industry. . . Owens-Illinois has a history of nearly three-quarters of a century in glass research and manufacture. It is not only the leading manufacturer of glass containers, but its laboratories have developed to a practical state two of the most promising of today's building materials . . . glass fiber and glass block.



The Home of the Press-Citizen, Iowa City, Iowa—Kruse & Klein, Architects

SPECIAL FEATURES AND of Owens-Illinois INSULUX

DESIGNS AND SIZES

● Insulux Glass Block are available in standard sizes and designs as shown on pages 12 and 13 following. They not only include rectangular blocks for simple panel construction, but corner and radial blocks to permit the introduction of variety into the design, and to permit finished corner construction.

BUILDING CODE APPROVAL

For their recommended uses, Insulux Glass Block have met with gratifying acceptance by and approval of state and municipal building commissioners, including the Pacific Coast Building Officials Conference. The strength of individual units and panels, their wind resistance, their fire and hose stream resistance, and other essential physical properties have been demonstrated at Purdue, Columbia and Leland Stanford, Jr. Universities, the National Bureau of Standards, and at the Underwriters' Laboratories, Chicago. These tests have been conducted in the presence of and to the satisfaction of numerous building code authorities. Official approvals conform to Owens-Illinois Glass Company's Basic Specifications, see page 19.

West Coast approvals, however, due to local demands, require smaller maximum panel sizes and additional reinforcement. Existing local requirements for the use of glass block are available on request.

CONTROLLED LIGHT TRANSMISSION

The intensity of light transmitted by Insulux is controlled by face design selected. The amount of incident light transmitted by the various designs ranges from 27.6 per cent to 86.5 per cent. Thus, interior light may be controlled within a wide range of practical limits.

CONTROLLED LIGHT DIFFUSION

From the standpoint of light transmission and light diffusion, Insulux face designs or patterns should be considered in two classes:

1. When large glass areas for daylight transmission are necessary, particularly in factories, school-rooms and other similar types of structure where close work is done, the following patterns have found the best acceptance—

- No. 1, ribbed face, 78.5% transmission
- No. 7, smooth face, 84.0% transmission
- No. 11, ribbed face, 86.5% transmission

2. Where the decorative qualities of the block are paramount, or where the block are used principally on the north exposure, the following patterns have found the best acceptance—

- No. 2, ribbed face, 73.4% transmission
- No. 16, smooth face, 84.4% transmission
- No. 17, smooth face, 84.0% transmission

(Complete information on each block is available on pages 12 and 13.)

HIGH THERMAL INSULATION

The high resistance of Insulux to heat loss by conduction, due largely to the dead air trapped at a

partial vacuum within the block, materially reduces the cost of air conditioning and artificial heating—both in initial and maintenance cost.

CONDUCTIVITY

The average coefficient of heat transmission in Btu's per hour per square foot per degree F. difference in temperature for Insulux is extremely low—.29—and compares favorably with other materials many times the thickness of an Insulux wall.

ELIMINATION OF CONDENSATION

Condensation on the inside of windows during cold weather causes deterioration of sash. It is particularly prevalent in buildings where a high degree of humidity is maintained, such as tobacco factories, dairies, food plants, textile and paper mills, etc. Insulux, because of its high insulating value, will under most conditions, eliminate this condensation and resulting deterioration. At the conclusion of extensive tests, Purdue University reported the following outside temperatures as necessary to produce condensation on the inside of the building with the inside air at 70 degrees and a relative humidity of 40 per cent:

Insulux —16.4 degrees F.
Steel Sash +36.0 degrees F.



● Insulux light in The Hecht Company Warehouse, Washington, D.C. Abbott, Merkt and Company, Architects.

ADVANTAGES..

Glass Block

REDUCED AIR INFILTRATION

Because the standard method of erecting Insulux is to lay it up in mortar with caulked expansion joints at jambs and head, air infiltration is reduced to a minimum. This reduction aids materially in reducing heat loss and maintaining desirable interior conditions of temperature and humidity.

RESISTANCE TO MOISTURE PENETRATION

At the direction of Purdue University authorities, a panel of INSULUX Glass Block was constructed according to standard specifications and laid horizontally for one week under a head of three inches of water. No trace of moisture was found on the underside of the mortar joints at any time. Other panels in actual buildings, which had been exposed to the weather for a period of one year, were subjected to water sprays designed to simulate a driving rain. This test was run for 27 hours without the appearance of moisture on the reverse side of the panel.

RESISTANCE TO SOLAR HEAT TRANSMISSION

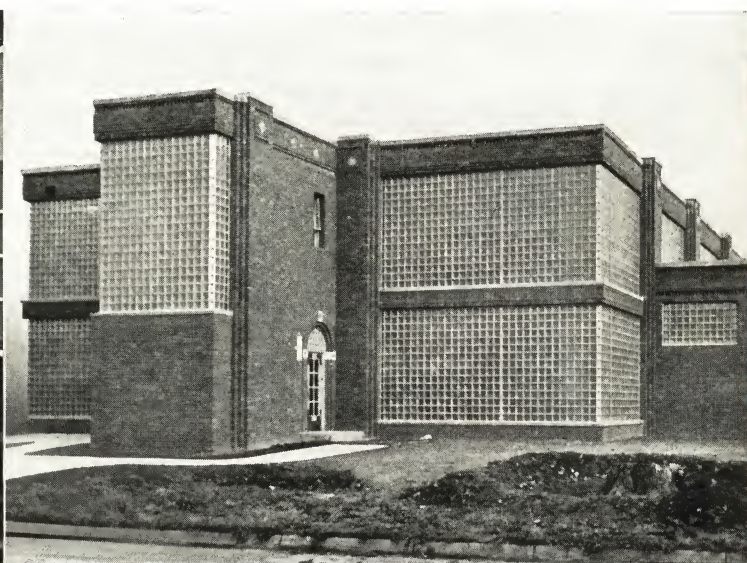
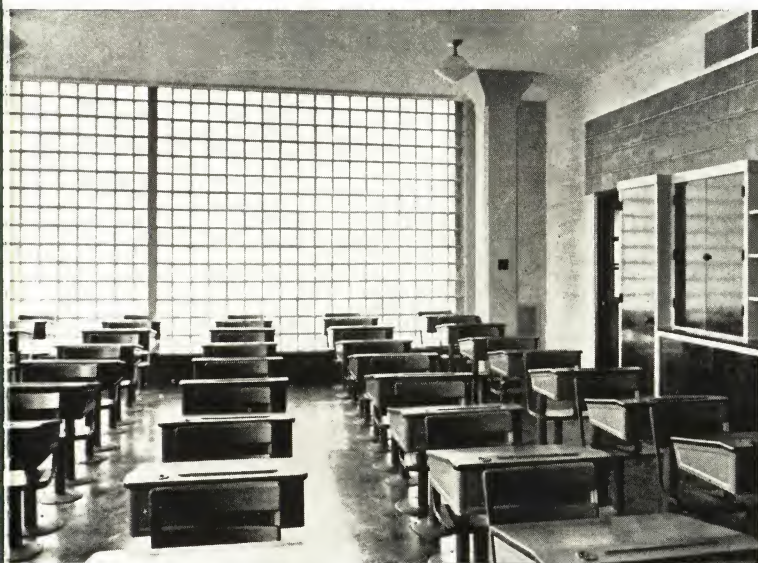
Because of their variable values of controlled light transmission, due to the variety of available face patterns, INSULUX Glass Block can

be employed to reduce materially solar heat transmission. Purdue University authorities, at the conclusion of elaborate tests on the solar heat transmission of INSULUX as compared with steel sash (testing equal areas of both materials), say: "The glass block No. 201 (Pattern No. 1) permitted 38.3 per cent less solar heat to pass than did the steel sash when exposed continuously to the sun; 37.7 per cent less when exposed to the east, 51.5 per cent less when exposed to the south; and 48 per cent less when exposed to the west." Comparatively, they further point out that a steel sash eliminates an average of but 20.4 per cent of the solar heat.

RECOMMENDED DESIGN VALUES FOR SOLAR HEAT TRANSMISSION

Exposure	Degree of Shading	Btu per sq. ft. per hr.
East	0	33
East	$\frac{1}{2}$	22.5
East	Full	16.3
South	0	50
South	$\frac{1}{2}$	34
South	Full	28
West	0	57
West	$\frac{1}{2}$	39
West	Full	23

Elkader School, Elkader, Iowa. Oren Thomas, Architect. Extensive use of Insulux increases intensity of natural light in rooms and corridors without excessive heat loss. Insulux in classrooms keeps out dust, dirt and noise. Mechanical ventilation maintains more equable temperature in classrooms.



SPECIAL FEATURES AND ADVANTAGES OF OWENS-ILLINOIS INSULUX GLASS BLOCK

RESISTANCE TO SOUND TRANSMISSION

Tests to determine the sound transmission through INSULUX Glass Block panels were conducted in the Sound Chamber of the National Bureau of Standards, Washington, D. C. The average sound reduction factor over a range of nine frequencies was found to be 40.7. This factor is expressed in decibels, and is known as the transmission loss. It is conclusive proof of the fact that INSULUX compares favorably with the usual type of plastered partition used in fireproof construction. Insulux is now in use adjacent to elevated railways in Chicago and in New York. It aids in reducing sound transmission from room to room, and in outside walls is effective in reducing street noise.

STRONG PRACTICAL MORTAR BOND

Tests on INSULUX panels show an average strength of 63 pounds per square inch in tension, and 200 pounds per square inch in shear at the mortar joints. In comparison with the average mortar bond strength of comparative clay brick work, these values are most favorable. They are the result of the special mortar bond surface that is available only on Owens-Illinois INSULUX Glass Block.

STRUCTURAL STRENGTH

As a result of the exclusive Owens-Illinois method of manufacture, Insulux Glass Block has a uniform wall thickness that makes it possible to anneal the block properly, and to eliminate internal strain. This develops to the utmost the natural strength of the glass. INSULUX is not offered as a load-bearing material, yet it possesses ample compressive strength to be self-supporting within the limits prescribed by the ratio of its thickness to any practical height. Comprehensive tests show that individual units develop a minimum ultimate strength of 1500 pounds per square inch. The ultimate strength of panels of INSULUX Glass Block, laid up in accordance with specifications on page 19, is 400 pounds per square inch. INSULUX panels have successfully withstood, with no visual failure, air pressure up to 120 pounds per square foot. On tests made on an INSULUX panel measuring 7 feet 3 inches wide by 8 feet 7 inches high, loadings up to 80 pounds per square foot pressure, produced deflec-

tion of .045 inches. On release of pressure, the panel returned to its original position. This pressure corresponds to a wind velocity of 162 miles per hour. These results show that INSULUX Glass Block walls will withstand, with a more than adequate factor of safety, the usual building code requirements for wind pressure.

COMPARATIVE THERMAL EXPANSION

The accepted coefficient of expansion for brick masonry is 0.0000031, and for broken stone concrete 0.0000067, the coefficient of expansion for INSULUX Glass Block is 0.0000045, which is midway between the two types of masonry mentioned. This coefficient will vary slightly, depending on the type of mortar used. This difference in expansion between INSULUX panels and abutting materials is compensated for by expansion joints as set forth on page 19.

CLEAN—SANITARY

INSULUX Glass Block walls are easy to clean. It is the natural characteristic of glass to be non-absorbent to liquids, odors and grease. Several of the INSULUX patterns have smooth exterior faces, the designs being impressed only on the interior faces of the block. In other blocks or patterns, the faces have simple ribs running vertically on the exposed exterior and horizontally on the interior. The character of these surfaces minimizes the accumulation of surface dirt and facilitates its removal.

LOW MAINTENANCE

INSULUX Glass Block walls and panels require almost no maintenance other than occasional cleaning. The hard, brilliant surface of the block has the natural permanence and durability of glass. Obviously, INSULUX does not oxidize nor require painting, either inside or out.

RENEWAL AND REPLACEMENT

A damaged glass block can be removed easily from the wall by chipping out or by drilling holes in the mortar joints at opposite corners, then, with a keyhole saw, sawing out the block. The new block is then buttered with mortar, inserted in place and the job completed by pointing.

Practical ...FOR TRADITIONAL DOMESTIC ARCHITECTURE



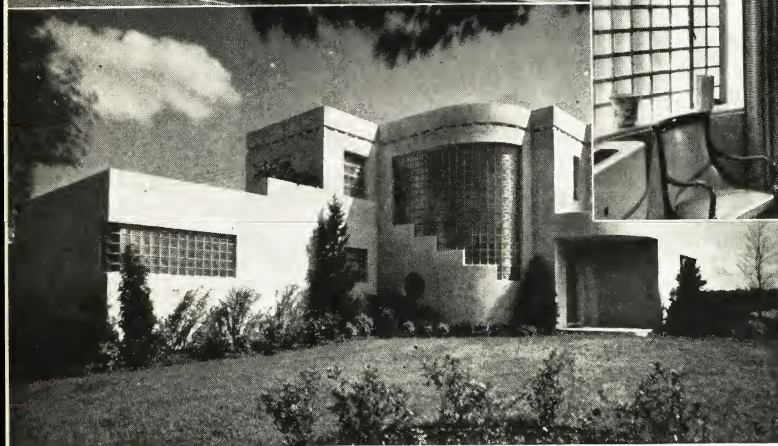
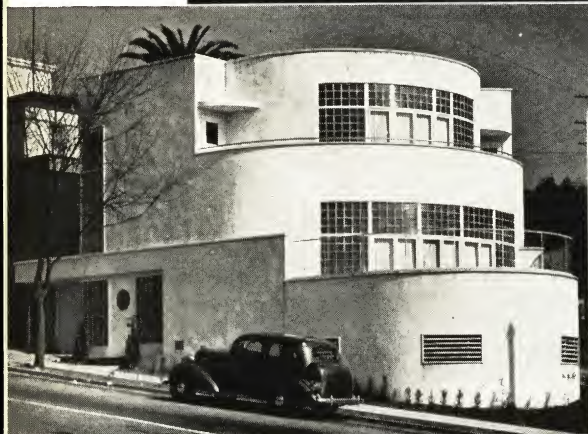
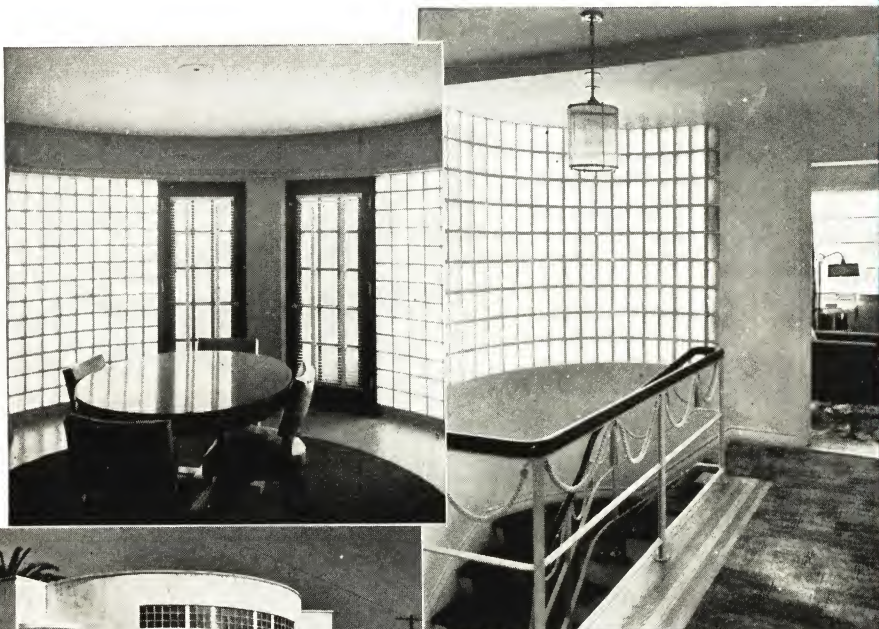
Long Island Homes
Alfred S. Levitt
Designer.

● Although Owens-Illinois INSULUX Glass Block is a thoroughly modern building material, the illustrations on the page clearly reveal its ready adaptability to traditional house architecture. Here are shown just a few of the many ways that INSULUX is being used to bring new beauty and comfort to both large and small homes.

WELL-SUITED TO MODERN RESIDENTIAL DESIGN...



● Here are shown some of the many attractive applications of Owens-Illinois INSULUX Glass Block to modern architectural design. Light The Modern Way, added comfort and arresting beauty are brought to these homes through medium of INSULUX.



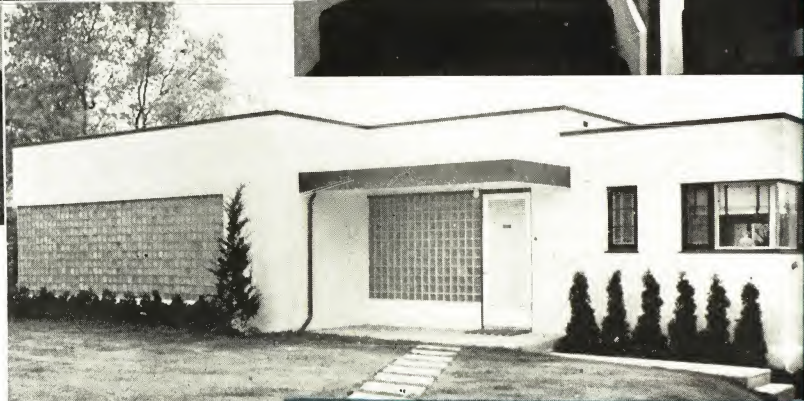
Dining room, residence Dodge City, Kansas... Don G. Purcell, Supervising Architect.

Suburban residence, San Francisco. . . Clemens Friedell, Architect.

St. Louis residence. William P. McMahon and Sons, Architects.

Home, Berkeley, California... John B. Anthony, Architect.

Living room, Fisher Studio Apartments, Chicago. Andrew N. Rebori, Architect. J. Edgar Miller, Artist.



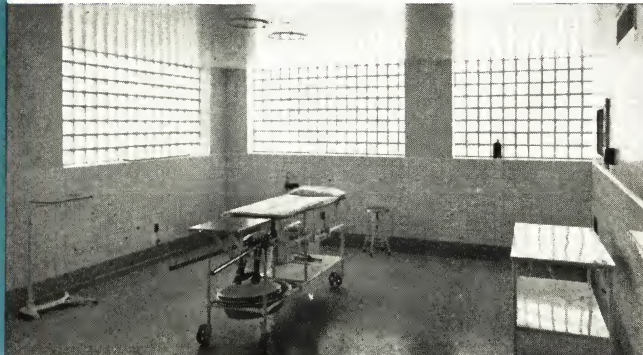
Stairway, St. Louis residence. William P. McMahon and Sons, Architects.

Residence, Benton Harbor, Michigan. Pasquale Iannelli, Architect.

WIDELY USED IN OFFICES, SCHOOLS AND HOSPITALS...

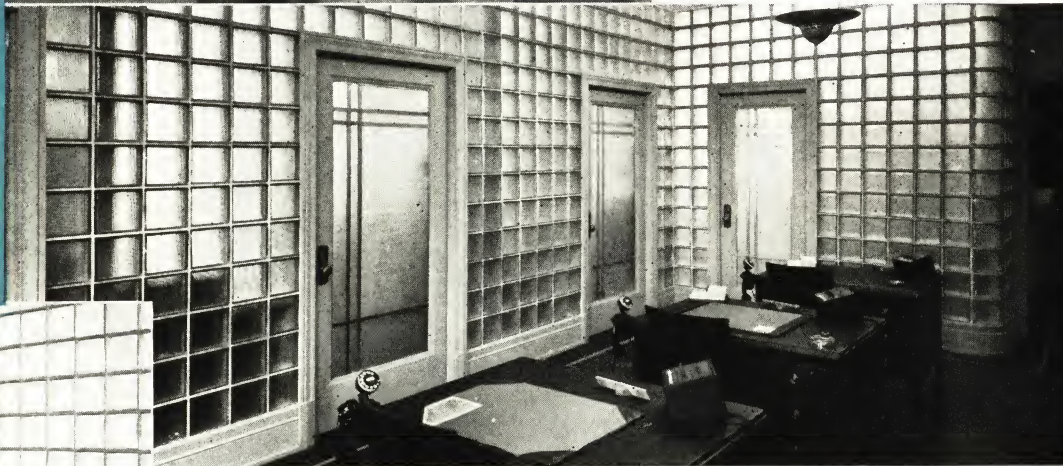


● The wide use of Owens-Illinois INSULUX Glass Block to provide Light The Modern Way is disclosed by the illustrations on this page. Wherever an abundance of diffused daylight is needed for any purpose INSULUX fulfills the requirements.



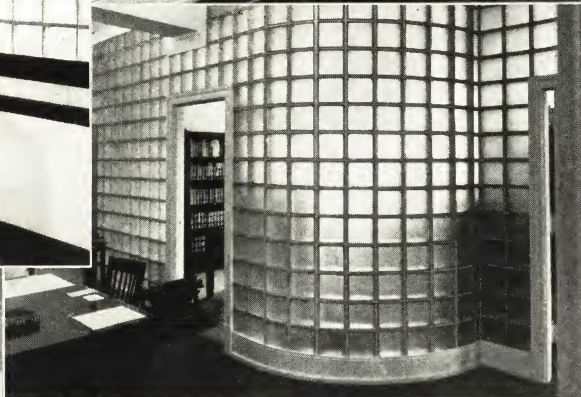
Campbell Clinic, Memphis, Tenn...Furbringer & Ehrman, Architects.

Office Building, Milwaukee, Wisconsin...Edwin J. Kraus, Architect.

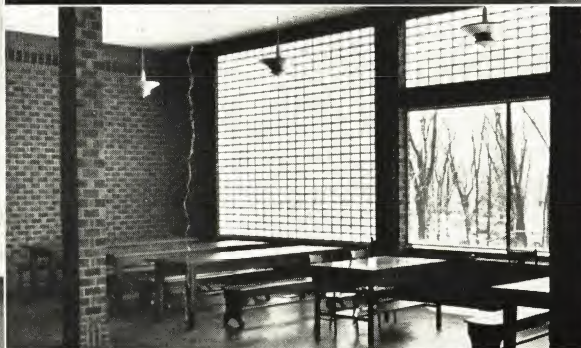


Gay Engineering Corporation, Los Angeles. . . Designed and erected by own staff.

Office, First Wisconsin National Bank Building... Edwin J. Kraus, Architect.



Doctor's Office, Clayton, Missouri. . . Harris Armstrong, Architect.



University of Kentucky, Lexington. . . J. T. Gillig, Architect.

INSULATION . . . LIGHT TRANSMISSION . . . AND LOW

Carrier Corporation, Syracuse, N. Y., uses Insulux in modernization of old building to provide light and to aid in economical air conditioning of structure. Austin Company, Builders.

MEAT PACKING
Cudahy Packing Plant, Albany, Georgia. Designed by own staff.



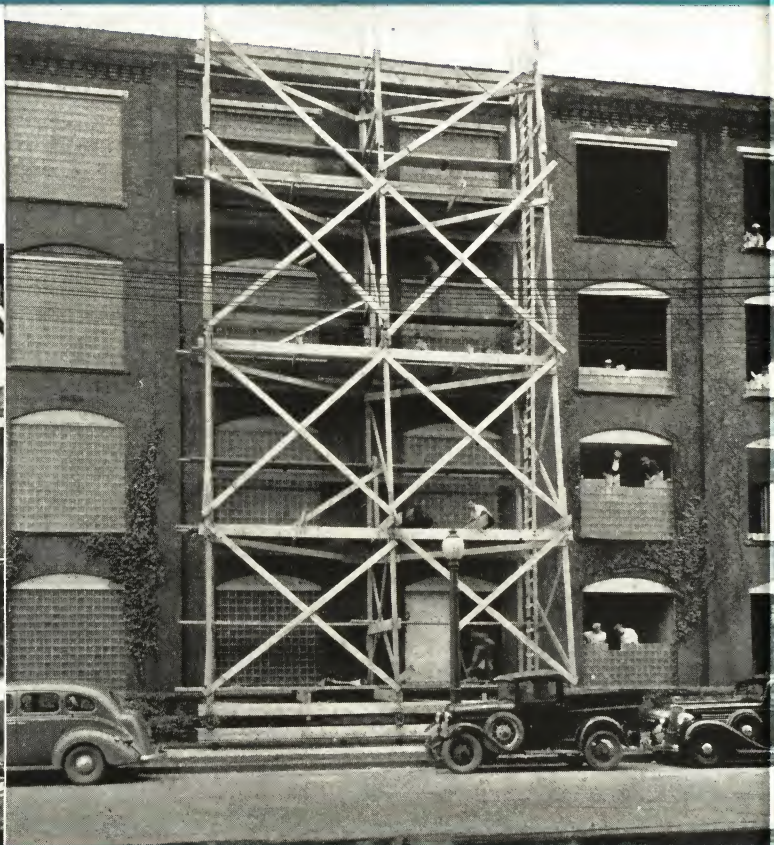
STEEL
INSULUX in this pickling plant admits ample light yet provides insulation — resists acid fumes.



MANUFACTURING
Press Building Standard Register, Dayton, Ohio. Designed and built by the Austin Company, Cleveland.



REMODELING
Heavy hardware and mill supplies . . . Schaeffer and Hooton, Architects.



● Light plus insulation, an outstanding need of industry today, is provided in ideal combination by Owens-Illinois INSULUX Glass Block, the modern building material. A hollow, partially evacuated, light-giving glass unit, laid up in mortar by methods well known to the mason and bricklayer, INSULUX greatly reduces heat loss from infiltration and conductance. This combination of advantages solves many problems for industry—the need for light to create proper working conditions and the increasing necessity of maintaining uniform controllable conditions of temperature and humidity. Organizations benefiting from INSULUX advantages today represent Steel, Tobacco, Rayon, Silk, Paper, Printing, Bottling, Distilling, Meat Packing, Canning, Dairies, Automobiles, Foods, Railroads, Milling, Cans, Electrical, Machine Tool, Films, Glass, Chemicals, research laboratories and many other types of industry.

MAINTENANCE ARE ESPECIALLY USEFUL TO INDUSTRY

WAREHOUSE

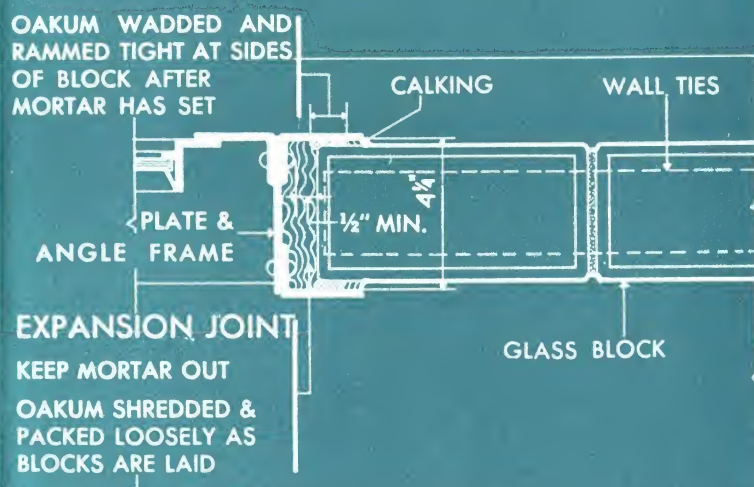
The Hecht Company Warehouse, Washington, D. C., Abbott, Merkt & Company, Architects.

MILLING

Omar Mills, Inc., Denver, Colorado, Horner-Wyatt Engineering Co., Engineers.

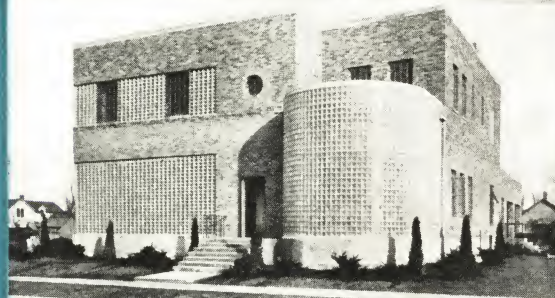


Below: Typical jamb detail for windows in Insulux panels, from Hecht warehouse pictured above.



BOTTLING

Coca-Cola Bottling Co. Plant, Mitchell, So. Dak., Floyd Kings, Architects.



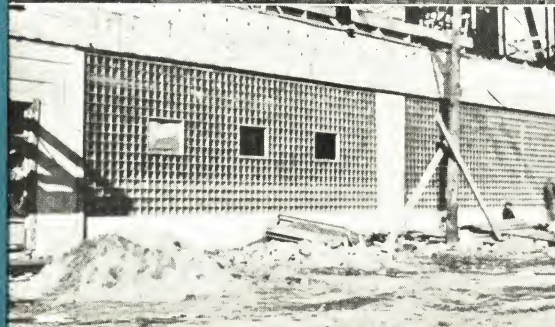
PHARMACEUTICALS

Bristol-Myers Co., Hillside, N. J. Wigton-Abbott Corp., Engineers and Contractors.



RAILROADS

INSULUX panels under construction assure light and insulation. McKim, Mead & White, Architects.



PATTERNS, SIZES AND DESCRIPTION OF

RECTANGULAR BLOCKS

HOW BLOCKS ARE NUMBERED

For convenience of and at the request of dealers and contractors, individual Insulux Blocks are numbered in four series, 100, 200, 300 and 400, each of which designates size. The last two digits of each series are used to designate pattern or design. A 302 block is a 300 series (size) and a No. 2 design. The factory designation, where it varies from this numbering, is retained in light face type within brackets for our convenience in manufacture and for identification in invoicing. The letter H indicates half blocks. Designs, shapes, and sizes are subject to change without notice.

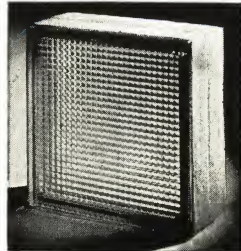
LOW LIGHT TRANSMISSION BLOCK

Insulux may also be had in a special pattern of low light transmission. A No. 103 block is available with two smooth exterior faces, an interior diamond shaped pattern and a light transmission of 27.6%.

SERIES AND SIZE OF RECTANGULAR BLOCKS

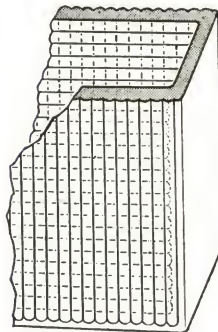
Series No.	Sizes in Inches
100 (1)	8 x 4 $\frac{7}{8}$ x3 $\frac{3}{8}$
100-H (1-H)	3 $\frac{7}{8}$ x 4 $\frac{7}{8}$ x3 $\frac{3}{8}$
200	5 $\frac{3}{4}$ x 5 $\frac{3}{4}$ x3 $\frac{3}{8}$
300	7 $\frac{3}{4}$ x 7 $\frac{3}{4}$ x3 $\frac{3}{8}$
400	11 $\frac{3}{4}$ x11 $\frac{3}{4}$ x3 $\frac{3}{8}$

DESIGN NO. 1

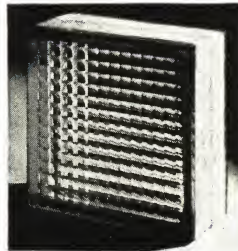


TRANSMITS
78.5%
OF INCIDENT LIGHT

Design consists of 1/4-in. convex ribs carried vertically on both exterior faces and horizontally on both of the interior faces.

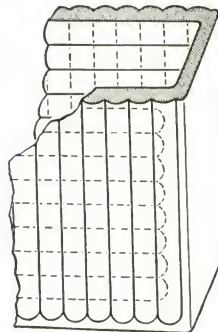


DESIGN NO. 2

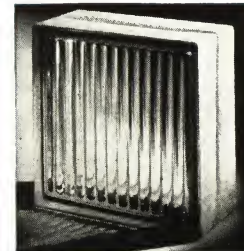


TRANSMITS
73.4%
OF INCIDENT LIGHT

Design—1/2-in. (1 in. for 400 series) convex ribs carried vertically on both exterior faces and horizontally on both of the interior faces.

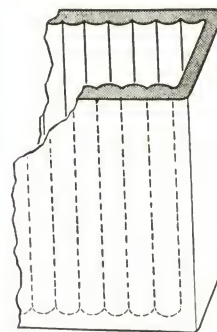


DESIGN NO. 7

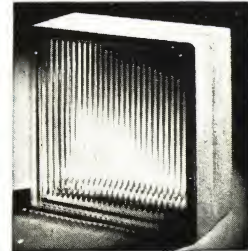


TRANSMITS
84.4%
OF INCIDENT LIGHT

Design—1/2-in. (1 in. for 400 series) convex ribs carried vertically on both of the interior faces. Both of the exterior faces are smooth.

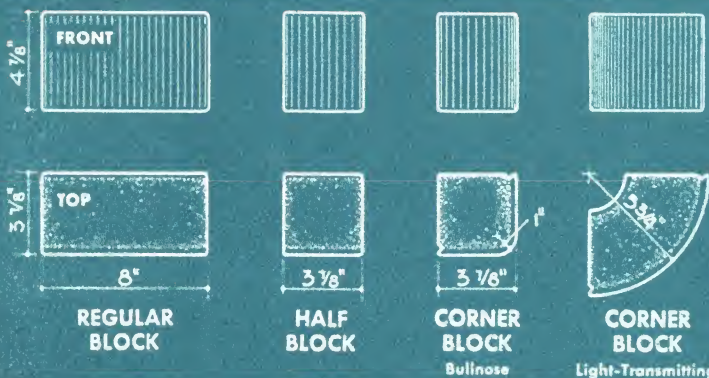
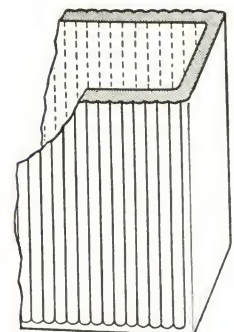


DESIGN NO. 11

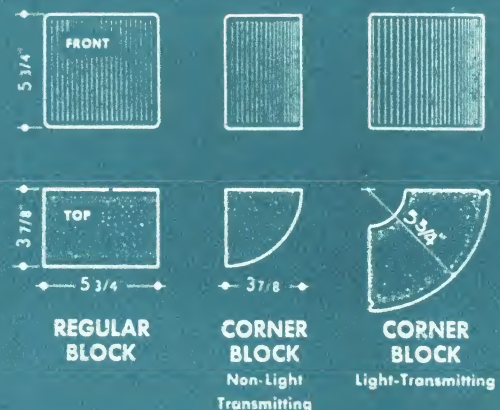


TRANSMITS
86.5%
OF INCIDENT LIGHT

Design consists of 1/4-in. convex ribs carried vertically on both of the exterior faces. Both of the interior faces are smooth.



100 SERIES

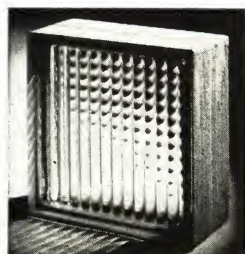


200 SERIES

OWENS-ILLINOIS INSULUX GLASS BLOCK

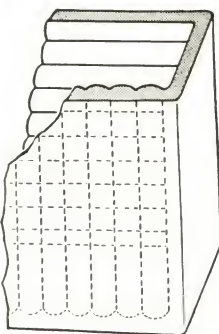
CORNER AND RADIAL BLOCKS

DESIGN NO. 16

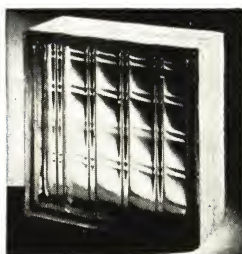


TRANSMITS
84.4%
OF INCIDENT LIGHT

Design—1/2-in. (1 in. for 400 series) convex ribs carried vertically on one interior face and horizontally on the other. Exterior faces smooth.

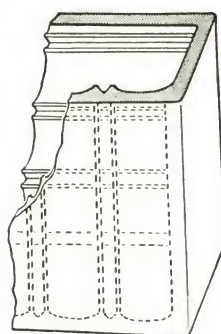


DESIGN NO. 17



TRANSMITS
84%
OF INCIDENT LIGHT

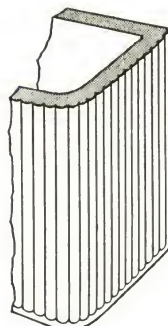
Design—1 1/2-in. (1 5/8 in. for 400 series) concave ribs on both interior faces—vertical on one, horizontal on other. Both exterior faces smooth.



BULLNOSE



Non-light-transmitting corner block to be used with No. 100 series. Size 3 7/8 x 3 7/8 x 4 7/8 in. Vertical exterior ribs on faces adjacent to bullnose corner, 1/4-in. ribs on the "A" block and 1/2-in. ribs on the "B" block.



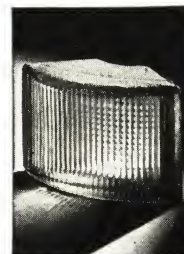
QUARTER ROUND



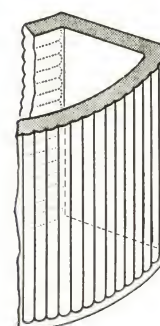
Non-light-transmitting corner block to be used with No. 200 and 300 series. Size for 200 series 3 7/8 x 3 7/8 x 5 3/4 in. and for 300 series 3 7/8 x 3 7/8 x 7 3/4 in. Vertical exterior ribs, 1/4-in. and 1/2-in. on "A" and "B" blocks respectively.



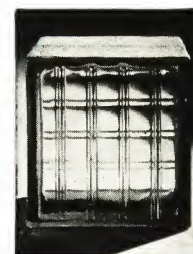
LIGHT TRANSMITTING CORNER



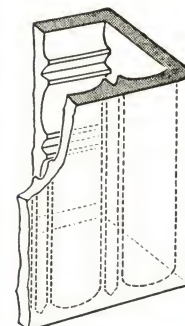
Block to be used with No. 100, 200 and 300 series. Height 4 7/8-in. for 100 series, 5 3/4-in. for 200 series, 7 3/4-in. for 300 series. Vertical ribs on face of large radius and horizontal on face of small radius, 1/4-, 1/2- and 1-in. ribs for "A," "B" and "C" block respectively.



RADIAL



Radial block can be laid to varying radii from 3 ft., 6 in. to 6 ft. through variation in mortar joint. Width of long face 7 3/4 in., of short face 7 in. Pattern same as No. 317 Block with inside ribs, vertical on wide face, horizontal on narrow face.



100-A—1/4" Rib (1-ABN,
100-B—1/2" Rib (1-BBN)

100-AL—1/4" Rib (1-AL)
100-BL—1/2" Rib (1-BL)

200-A—1/4" Rib
200-B—1/2" Rib
300-A—1/4" Rib
300-B—1/2" Rib

200-AL—1/4" Rib
200-BL—1/2" Rib
300-AL—1/4" Rib
300-CL—1" Rib

301-R
317-R (300-R)

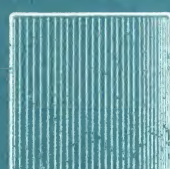


REGULAR
BLOCK



CORNER
BLOCK

Non-Light-Transmitting

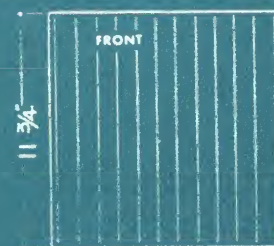


CORNER
BLOCK

Light-Transmitting



RADIAL
BLOCK



REGULAR
BLOCK

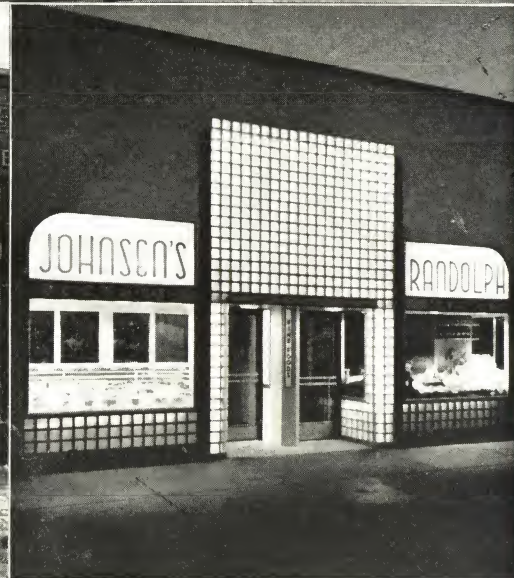
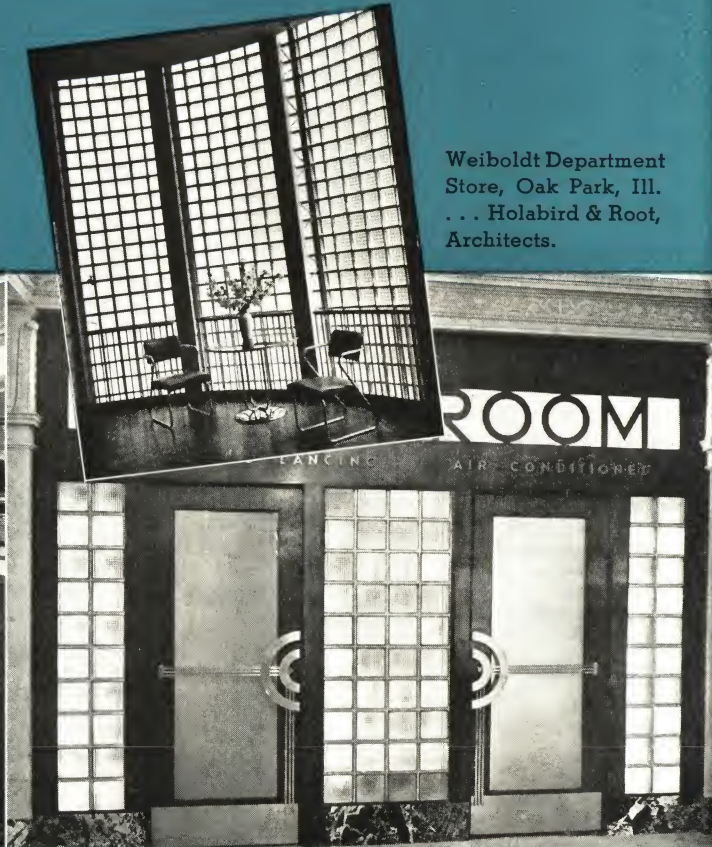


300 SERIES

400 SERIES

OWENS-ILLINOIS
Insulux GLASS BLOCK IN STORES,
 SHOPS, RESTAURANTS, HOTELS, DISPLAYS

Weiboldt Department Store, Oak Park, Ill.
 . . . Holabird & Root, Architects.



Colony Club (remodeled) Chicago. . .
 George Mitchell, Architect.

Modern Cocktail Lounge. . . Designed
 by W. & J. Sloane, New York City.

Mural Room, Baker Hotel, Dallas, Texas.
 Herbert M. Greene, LaRoche & Dahl,
 Architects.

Weiboldt Department Store, Oak Park,
 Illinois . . . Holabird & Root, Architects.

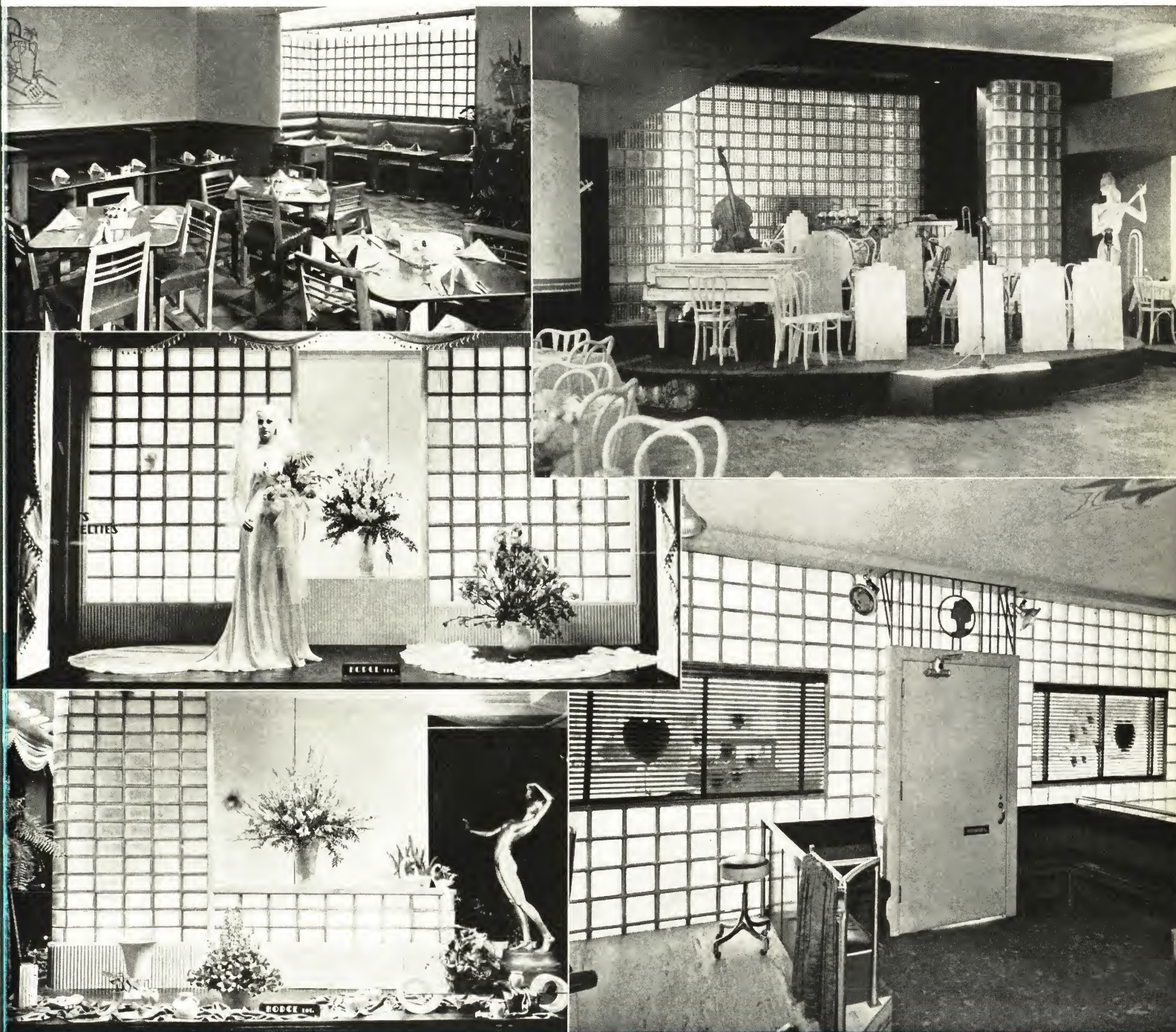
Before and after modernizing, Evanston,
 Ill. Designed by Palmer Personal Service.

Restaurant in "Italian Village," Dallas, Texas . . . O'Neil Ford, Architect.

Window Displays (center and bottom)
Hodge, Inc., florists, Buffalo, N.Y. . . .
James Patton, Designer.

Night Club in Washington - Youree
Hotel, Shreveport, Louisiana . . . William B.
Wiener, Architect.

Rarey's "Beauty Box," Long Beach, Calif.



On these pages are pictured just a few of
the many applications of Owens-Illinois
INSULUX Glass Block, where they are

used to add light, sparkle, color and
gaiety to surroundings—to stimulate the
imagination, and to draw patronage.

Insulux **STRENGTH**

FIRE RESISTANCE

and

WIND RESISTANCE

... DEMONSTRATED BY

AUTHORITATIVE TESTS

◆ Insulux Glass Block has been subjected to tests in leading laboratories to determine its physical characteristics, including strength in compression when set up in panels, strength in tension and shear at the mortar joint, resistance to lateral pressure (simulating wind pressure), resistance to sound transmission and resistance to fire. These tests have been conducted at the Underwriters' Laboratories, Inc., Chicago; the National Bureau of Standards, Purdue University, Leland Stanford, Jr. University, and Columbia University.

Information on strength and sound transmission is given on page 6 immediately preceding.

THOUSANDS OF ACTUAL INSTALLATIONS

Probably equally significant with these tests is the record of thousands of jobs of Insulux Glass Block which have permitted observation of actual performance under all kinds of field conditions. Insulux installations are now giving good service in every state in the Union, in Canada and several other foreign countries.

These have given an opportunity not only to check the physical characteristics of the material itself, but its erection, the performance of its mortar joint, both during application and in service, on large jobs and small—jobs using as much as 100,000 square feet of the block. Not only the design and physical specifications of the block itself, but the specifications for erection have been developed out of this experience. Back of all is a history of nearly three-quarters of a century in glass development and glass research by Owens-Illinois.

FIRE TEST METHODS

Insulux Glass Block panels laid up in standard specification mortar and provided with specification bond ties have been subjected to both fire tests and fire and hose stream tests.

The panels were all rectangular but of varying dimensions in accordance with the requirements of the particular test specifications. The test furnaces were designed either according to the practice of the Underwriters' Laboratories and of the National Bureau of Standards, Department of Commerce, or of the New York State Department of Labor. The former were suitable for a test panel of approximately 120 square feet in area and the latter for typical window sizes.

Two time-temperature curves were followed in the tests, either that of the American Society for Testing Materials, or the New York State Department of Labor.

OFFICIAL APPROVAL

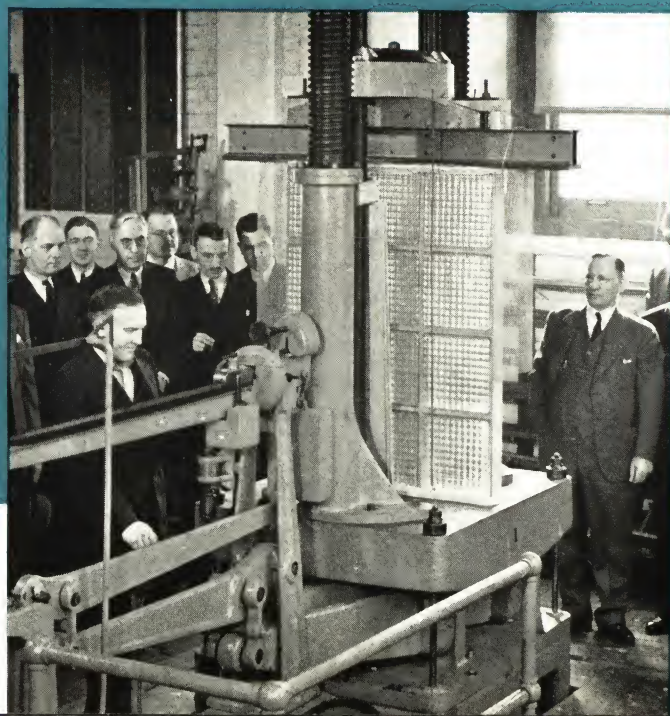
Insulux has successfully met the New York State Department of Labor requirements and is approved by the Industrial Commission as a Fire-proof Window.

Insulux is listed by the Underwriters' Laboratories, Inc., Chicago: (See Retardant 2582, Sept. 8th, 1937)

"For window openings not exceeding 120 square feet in area, nor 12 feet in width or height, subject to light fire exposure (Class F Openings)."

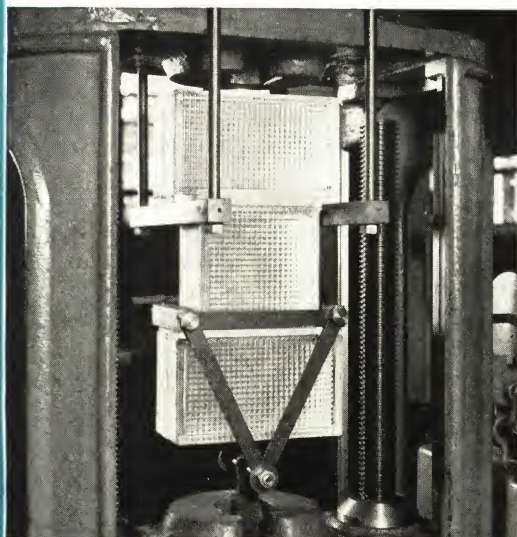
The above Underwriters' listing is for No. 101 Insulux Glass Block laid in a 1-1-4 Portland cement-lime-sand mortar reinforced in each horizontal joint with standard expanded metal wall ties, the panel set in chases at jambs and head, packed with mineral wool and caulked.

This construction may be called for in exterior walls by local fire insurance rating bureaus where fire exposure demands it, but it is not required on street fronts and in other locations of normal exposure.



Load test on Insulux panel.

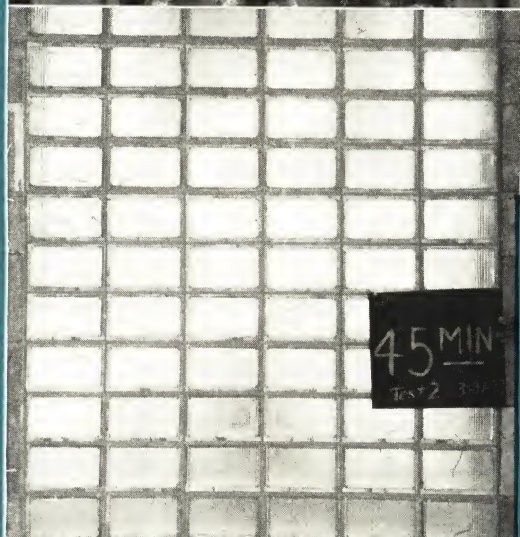
Insulux specimen loaded for tension on mortar joints.



Hand in contact with Insulux Glass Block panel during fire test. 900 degrees F. inside.

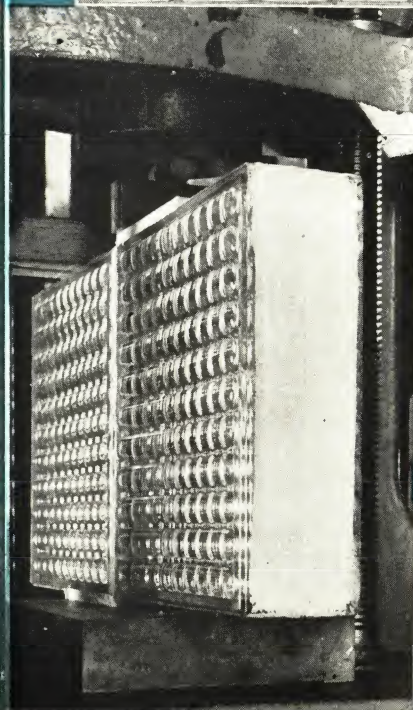


Insulux panel subjected to pressure test simulating wind pressure.



Insulux panel laid flat and subjected to uniform loading with sand.

Insulux Glass Block panel after 45 minutes of fire. . . Average temperature 1665 degrees F.



Hot side of Insulux panel resisting hose stream immediately after withdrawal from furnace on completion of standard 45-minute fire test.

Operator making observations on Insulux panel during Underwriters' Fire and Hose Stream test.

Insulux specimen loaded for direct shear at mortar joints.

OWENS - ILLINOIS

Insulux

ERECTION PROCEDURE AND PANEL SIZES

ERECTION OF PANELS

The following drawings illustrate the proper procedure for the installation of Insulux panels in a masonry wall. The same procedure is to be followed whether jambs be steel channels, I beams, T bars or other structural shapes (See details page 20, 21 and 22).

STEP No. 1

PRELIMINARY PREPARATION

CHASE TO BE FORMED AS SHOWN. BACK OF CHASE TO BE LINED WITH AT LEAST 1/2" OF SHREDDED OAKUM PLACED LOOSELY TO FORM EXPANSION JOINT. PAINT SILLS WITH ASPHALT EMULSION.

STEP No. 2

LAYING INSULUX

KEEP ALL MORTAR OUT OF EXPANSION JOINT. USE FULL HEAD AND BED JOINTS SPREADING MORTAR EVENLY. BED WALL TIE IN CENTER OF MORTAR JOINT.

STEP No. 3

BRACING PANEL AGAINST LATERAL PRESSURE.

AFTER PANEL IS COMPLETE AND MORTAR HAS SET, WAD OAKUM AND RAM TIGHT AT SIDE OF BLOCK. PLACE WOODEN WEDGES IN CHASE ON REVERSE SIDE TO HOLD PANEL PLUMB.

STEP No. 4

RAM OAKUM ON OPPOSITE SIDE, CLEAN PANEL AND CALK

RAM OAKUM TIGHT AT SIDE OF CHASE ON REVERSE SIDE OF PANEL AND REMOVE WOODEN WEDGES. DO NOT DRIVE OAKUM REHIND BLOCKS. CLEAN PANEL AND POINT WITH AT LEAST 3/8" CALKING.

DIMENSION TABLE

To obtain clear opening dimensions add at least 3/4 of an inch horizontally, and 1/2 inch plus maximum beam deflection vertically to the course dimensions to provide proper clearances for expansion.

No. of Units	47 7/8" x 8"		53 3/4" x 5 3/4"	73 3/4" x 7 3/4"	113 3/4" x 11 3/4"
	Height	Width	Height or Width	Height or Width	Height or Width
	1/4" joints	1/4" joints	1/4" joints	1/4" joints	1/4" joints
1	5 1/8"	8 1/4"	6"	8"	1' - 0"
2	10 1/4"	1' - 4 1/2"	1' - 0"	1' - 4"	2' - 0"
3	1' - 3 3/8"	2' - 0 3/4"	1' - 6"	2' - 0"	3' - 0"
4	1' - 8 1/2"	2' - 9"	2' - 0"	2' - 8"	4' - 0"
5	2' - 1 5/8"	3' - 5 1/4"	2' - 6"	3' - 4"	5' - 0"
6	2' - 6 3/4"	4' - 1 1/2"	3' - 0"	4' - 0"	6' - 0"
7	2' - 11 7/8"	4' - 9 3/4"	3' - 6"	4' - 8"	7' - 0"
8	3' - 5"	5' - 6"	4' - 0"	5' - 4"	8' - 0"
9	3' - 10 1/8"	6' - 2 1/4"	4' - 6"	6' - 0"	9' - 0"
10	4' - 3 1/4"	6' - 10 1/2"	5' - 0"	6' - 8"	10' - 0"
11	4' - 8 3/8"	7' - 6 3/4"	5' - 6"	7' - 4"	11' - 0"
12	5' - 1 1/2"	8' - 3"	6' - 0"	8' - 0"	12' - 0"
13	5' - 6 5/8"	8' - 11 1/4"	6' - 6"	8' - 8"	13' - 0"
14	5' - 11 3/4"	9' - 7 1/2"	7' - 0"	9' - 4"	14' - 0"
15	6' - 4 7/8"	10' - 3 3/4"	7' - 6"	10' - 0"	15' - 0"
16	6' - 10"	11' - 0"	8' - 0"	10' - 8"	16' - 0"
17	7' - 3 1/8"	11' - 8 1/4"	8' - 6"	11' - 4"	17' - 0"
18	7' - 8 1/4"	12' - 4 1/2"	9' - 0"	12' - 0"	18' - 0"
19	8' - 1 3/8"	13' - 0 3/4"	9' - 6"	12' - 8"	19' - 0"
20	8' - 6 1/2"	13' - 9"	10' - 0"	13' - 4"	20' - 0"
21	8' - 11 5/8"	14' - 5 1/4"	10' - 6"	14' - 0"	21' - 0"
22	9' - 4 3/4"	15' - 1 1/2"	11' - 0"	14' - 8"	22' - 0"
23	9' - 9 7/8"	15' - 9 3/4"	11' - 6"	15' - 4"	23' - 0"
24	10' - 3"	16' - 6"	12' - 0"	16' - 0"	24' - 0"
25	10' - 8 1/8"	17' - 2 1/4"	12' - 6"	16' - 8"	25' - 0"
26	11' - 1 1/4"	17' - 10 1/2"	13' - 0"	17' - 4"	26' - 0"
27	11' - 6 3/8"	18' - 6 3/4"	13' - 6"	18' - 0"	27' - 0"
28	11' - 11 1/2"	19' - 3"	14' - 0"	18' - 8"	28' - 0"
29	12' - 4 5/8"	19' - 11 1/4"	14' - 6"	19' - 4"	29' - 0"
30	12' - 9 3/4"	20' - 7 1/2"	15' - 0"	20' - 0"	30' - 0"
31	13' - 2 7/8"	21' - 3 3/4"	15' - 6"	20' - 8"	31' - 0"
32	13' - 8"	22' - 0"	16' - 0"	21' - 4"	32' - 0"
33	14' - 1 1/8"	22' - 8 1/4"	16' - 6"	22' - 0"	33' - 0"
34	14' - 6 1/4"	23' - 4 1/2"	17' - 0"	22' - 8"	34' - 0"

TABLE SHOWING NUMBER OF REINFORCING MEMBERS* IN PANELS OF VARIOUS SIZES

		GREATEST DIMENSION OF PANEL IN FEET						
		6	8	10	12	14	16	18
LEAST DIMENSION OF PANEL IN FEET	6							1
	8							1
	10							1
	12					1	1	1
	14				1	1	1	1
	16			1	1	1	1	1
	18		1	1	1	1	1	2
	20	1	1	1	1	1	2	2

*Size and design of member to be calculated.
Note: For panels larger than 20 ft. in any dimension, provide intermediate expansion joints. See details 4, 5 & 7 on page 20.

BASIC SPECIFICATIONS FOR *Owens-Illinois Insulux* CONSTRUCTION

GLASS BLOCK—The Glass Block as shown on the drawings or called for in the specifications shall be hollow, partially evacuated, water-clear units of pressed glass construction as manufactured by the Owens-Illinois Glass Company. The face dimensions of the glass block shall be (4 $\frac{1}{4}$ inches by 8 inches), (5 $\frac{1}{4}$ inches by 5 $\frac{1}{4}$ inches), (7 $\frac{3}{4}$ inches by 7 $\frac{3}{4}$ inches), (11 $\frac{1}{4}$ inches by 11 $\frac{3}{4}$ inches) as shown on the drawings. All walls of the blocks shall be not less than 3/16 of an inch thick. All mortar-bearing surfaces of the block shall be flat with a tolerance of $\frac{1}{8}$ of an inch, plus or minus, and shall be pre-coated with an alkali and moisture resistant grit material of satisfactory adhesive and bonding qualities.

MORTAR—Materials used in making the mortar shall be measured by volume. For this purpose, 25 pounds of quick lime or 40 pounds of hydrated lime shall equal one cubic foot of Portland cement. The mortar shall be composed of one part Portland cement, one part lime, and four parts sand. It shall be mixed in a water-tight box and hoed from end to end until thoroughly incorporated. Consistency shall be such that the hoe is clean when withdrawn from the mortar and when tested by the use of a flow table, gives a flow number of about 90.

CEMENT—All cement used in mortar shall be Portland cement complying with the specifications of the American Society for Testing Materials.

LIME—All lime used for mortar may be either quick lime or hydrated lime. Quick lime shall be fresh, well burned, free from ashes, core, clinker, other foreign materials or air slaked particles. Quick lime shall be slaked in a water-tight box, using sufficient water to prevent burning, and to make a creamy putty. During the slaking, it shall be thoroughly hoed to prevent burning. All slaked lime shall be aged for at least 7 days before using, and the resultant putty shall be sufficiently stiff to permit easy shoveling.

HYDRATED LIME—All hydrated lime shall be of standard brand, shall meet the standard specifications of the American Society for Testing Materials, and shall be delivered in the original packages of the manufacturer.

SAND—All sand used for mortar shall be clean, sharp and well graded with angular particles, free from vegetable matter, loam, clay, and other foreign matter. It shall comply with the standard specifications of the American Society for Testing Materials.

MASONRY MORTARS—A masonry mortar of high strength and low volume change may be used instead of the Portland cement and lime mixture, if desired. Any standard brand of mortar, of which there are several, having a compressive strength at the end of 28 days of 800 pounds per square inch, according to A.S.T.M. specifications, will be satisfactory. Such masonry mortar shall be mixed and used according to the manufacturer's directions.

WATER—Shall be clean, free from alkali and organic matter.

LAYING OF GLASS BLOCK—It is particularly important in the laying of glass block that both head and bed joints be completely filled with mortar. Blocks are **not** to be hit with a metal tool, but shall be shoved into place, compressing the head joints. Compress and point joints on both surfaces with metal pointing tools after the mortar has reached its initial set. The finished surface of the joint should be smooth and non-porous. The final cleaning should not be done until after the mortar

has reached its final set, in order to eliminate any possibility of injuring green mortar joints. If blocks must be disturbed after laying, clean them and then relay them. Blocks with exterior ribs are to be laid with ribs running vertically. Sills of panels are to be painted with asphalt emulsion before laying first mortar beds.

WALL TIES—Horizontal mortar joints are to be reinforced with 20-gauge expanded metal wall ties, 2 $\frac{3}{8}$ inches wide by 8 feet long, galvanized after forming. Ties are to run continuously by lapping ends 6 inches and are to be located as follows:

- No. 100 Series Block, every fourth course;
- No. 200 Series Block, every fourth course;
- No. 300 Series Block, every third course;
- No. 400 Series Block, every course.

Upon approval of the architect, an alternate wall tie of 20-gauge galvanized steel, 1 $\frac{1}{4}$ inches wide by 6 feet long, perforated with rectangular slots, 1 $\frac{1}{8}$ inches on center, may be substituted for the expanded metal type. Ties are not to be laid directly on the block, but are to be laid on the mortar and completely embedded in the center of the mortar joint.

ANCHORAGE—Insulux panels are to be anchored to and supported by the building structure as shown on the drawings. Whenever possible, panels are to be set in a "chase" (formed by masonry, concrete, wood or metal shapes) at the jambs and at intermediate stiffeners designed so as to provide lateral support and clearance for expansion. Small panels (not over 8 feet high nor more than 100 sq. ft. in area) may be anchored to adjoining masonry at the jambs by 20-gauge galvanized perforated metal ties 1 $\frac{1}{4}$ " x 24", laid in horizontal block joints and extended 12" into the masonry, located as frequently as wall ties. They are to be crimped or bent at the expansion joints. Panels longer than 12'-0" are to be supported at the head by angles inside and out. (See diagrammatic drawings on opposite page, and details on pages 20 and 21.)

INTERMEDIATE REINFORCING—Vertical or horizontal reinforcing members are to be provided for large glass block panels and are to be of size and shape as shown on the drawings. Glass block is to be securely anchored to these members.

EXPANSION JOINTS—Expansion joints are to be provided at the junction of glass block panels and all other materials except at the sill so that in no case will the connecting joints be filled with mortar or the block be in direct contact with the structure of the building except at the sill. Expansion joints at jambs of panels and at stiffeners are to be at least $\frac{1}{2}$ " in thickness. Expansion joints at heads of panels are to be thick enough to provide for maximum lintel deflection plus $\frac{1}{2}$ ". Increase thickness of expansion joints for extremely large panels and for panels in buildings in which appreciable structural movement may occur. Provide intermediate expansion joints (use intermediate stiffeners) for panels longer than 20 feet; shelf angles for panels higher than 20 feet. Fill expansion joints with loosely packed oakum as the block are laid, keeping these joints **entirely free from mortar**. After panels have set, wad and ram oakum tight between sides of block and sides of "chase" for support against lateral pressure. Care should be taken not to drive panels out of plumb. Point surface of joint with not less than $\frac{3}{8}$ " of waterproof caulking compound (See diagrammatic drawings on opposite page.) Use dry rope oakum.

FIRE RETARDANT PANELS—For Underwriters' specifications for fire retardant panels see bottom of column two, page 16.

OWENS-ILLINOIS TYPICAL *Insulux* CONSTRUCTION DETAILS

TYPICAL DETAILS FOR INSULUX PANELS IN MASONRY WALLS

Details 1, 2 and 3 show a typical method of installing Insulux panels in masonry walls. The use of a chase at the jambs, detail 2, is desirable for all panels and is particularly necessary for large panels. (See diagrammatic drawings for method of installation, page 18).

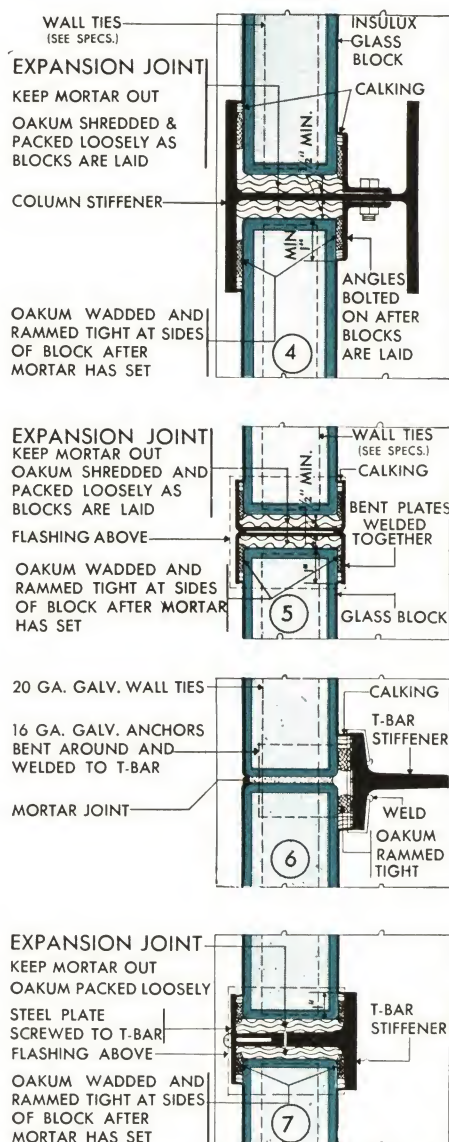
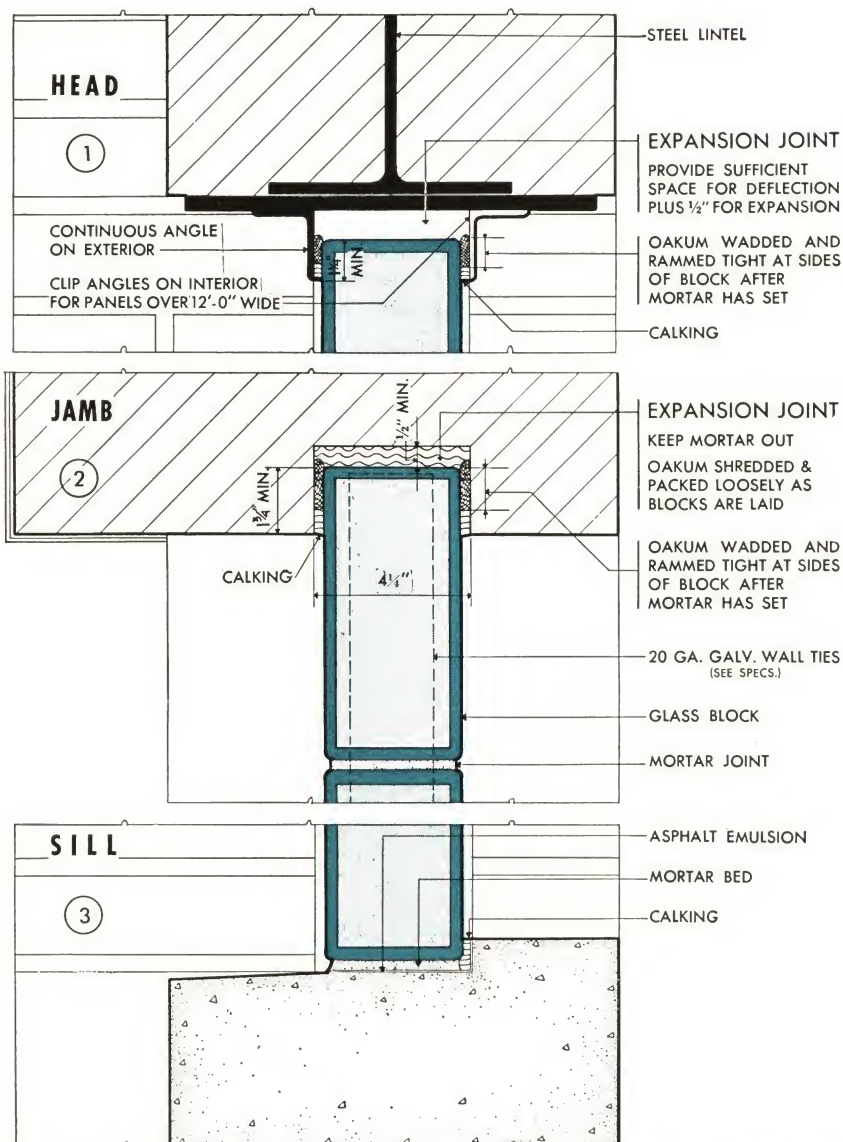
INTERMEDIATE REINFORCING

Large Insulux panels are to be reinforced with structural stiffeners spaced as shown in the table on page 18. Details 4, 5, 6 and 7 are typical methods of providing vertical reinforcement and intermediate expansion joints. Details 4, 5 and 7 are typical for long panels (more than 20'-0") providing for both reinforcement and expansion and are well adapted to use in continuous panels. Size of structural members are to be computed. In the design of vertical stiffeners care should be taken that no bolts, clips or other obstructions occur in the expansion joints where these members are connected to sills

and lintels. When stiffeners are attached to lintels, which deflect appreciably, provide sliding connection.

EXPANSION JOINTS AND ANCHORAGE

Where called for on these drawings "Expansion Joints" are to be not less than $\frac{1}{2}$ " thick plus maximum beam deflection at head and are to be increased accordingly for extremely large panels and for buildings in which appreciable structural movement may occur. These joints must be **entirely clear of mortar** and can be kept clear by filling them with loosely packed oakum as the blocks are laid. After panels have set, it is important to "Wad and ram oakum tight" in locations as called for on these details in order to provide adequate support against lateral pressure. When ramming oakum between sides of block and structural members, use large wads so that the oakum will "wedge" and will not be driven into the expansion joints. Wedge both sides of the panels at the same time to prevent driving them out of plumb. Point joints with a calking material.



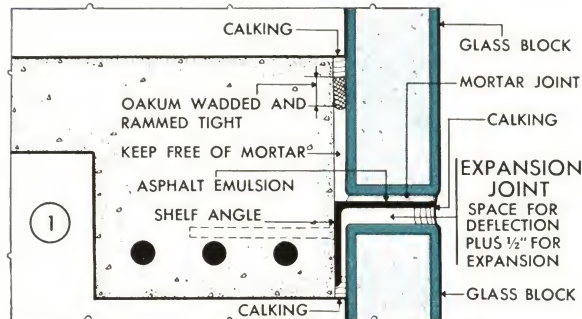
TYPICAL DETAILS FOR LARGE PANELS—12" WALLS

INTERMEDIATE REINFORCING

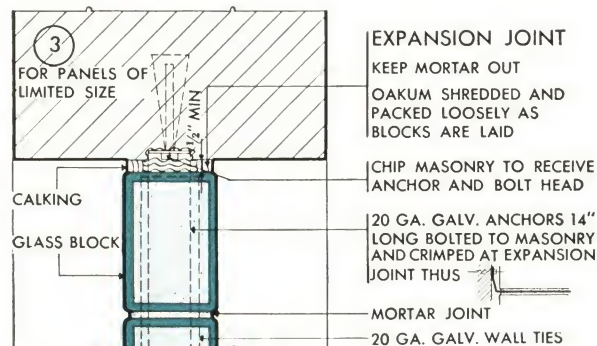
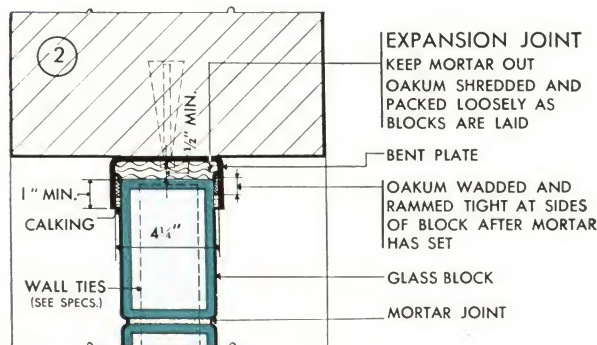
OWENS-ILLINOIS ALTERNATE *Insulux* CONSTRUCTION DETAILS

ALTERNATE DETAILS FOR INSULUX PANELS IN MASONRY WALLS

Details 4, 5 and 6 are alternate methods for installing panels in masonry walls. This method of anchorage should be confined to small panels (not more than 100 square feet or higher than 8 feet). Anchorage at the jamb is provided by means of 20 gauge galvanized perforated ties 24" long inserted 12" into masonry walls and extended into horizontal glass block joints. Anchors are to be crimped at expansion joints to allow for building and panel movement. Expansion joints are to be at least $\frac{1}{2}$ " thick and are to be **entirely free from mortar**. This type of expansion joint may be left open until job is finished, the joint is then inspected, cleared of mortar gobs and filled with loosely packed oakum and calked.



DETAIL AT SHELF ANGLE



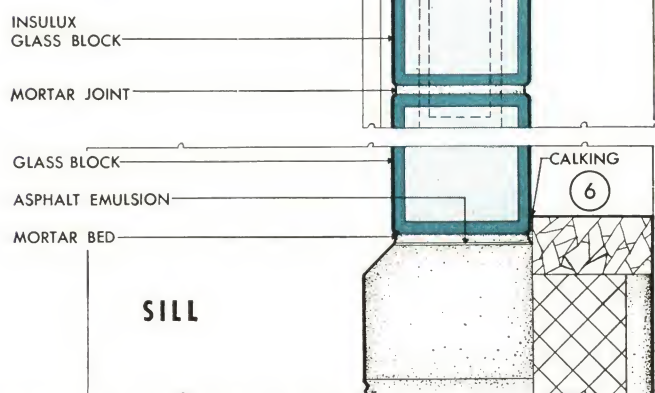
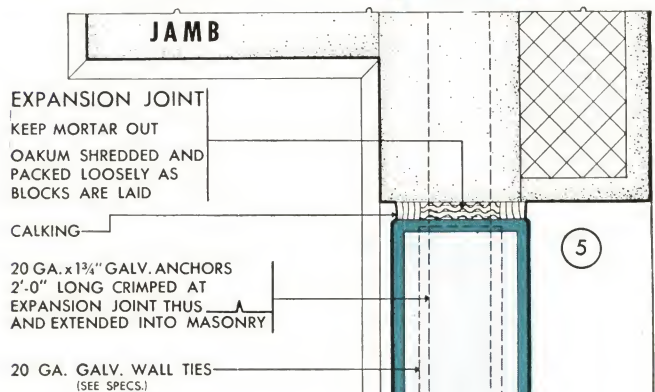
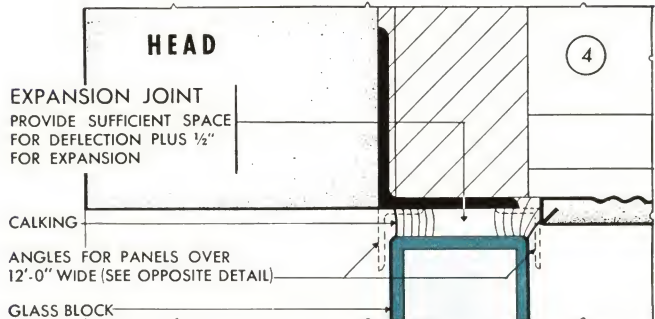
ALTERATION DETAILS—JAMB SECTIONS

SHELF ANGLE

Panels higher than 20 ft. are to be carried at intermediate points by shelf angles (Det. 1). The horizontal leg of the angle is to be wide enough to provide adequate bearing for the block. Ample clearance is to be allowed between the bottom of the angle and the top of the block for deflection and expansion.

PANELS IN ALTERATION WORK

When installing panels in buildings already constructed, Detail 2 is a typical method for anchoring large panels. If present opening size does not permit the installation of standard block, cut chases in brick work and install according to Detail 2 on page 20. Small panels may be anchored by bolting anchors to masonry (Det. 3). Allow adequate clearance between bolt head and block.



TYPICAL DETAILS FOR SMALL PANELS

OWENS-ILLINOIS CONTINUOUS *Insulux* PANELS IN COMBINATION WITH VENTILATING SASH

American Education
Press Building
Columbus, Ohio . . .
Richards, McCarty and
Bulford, Architects.
E. Elford and Son,
Contractors.

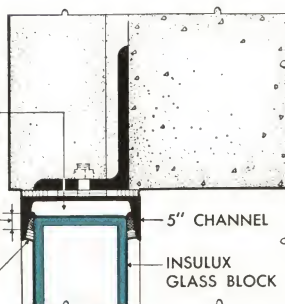


DETAIL-A

EXPANSION JOINT
SPACE FOR DEFLECTION
PLUS 1/2" FOR EXPANSION

OAKUM
WADDLED AND RAMMED
TIGHT AT SIDES OF BLOCK
AFTER MORTAR HAS SET

CALKING



DETAIL C

OAKUM WADDLED & RAMMED
TIGHT AT SIDES OF BLOCK
AFTER MORTAR HAS SET

CALKING

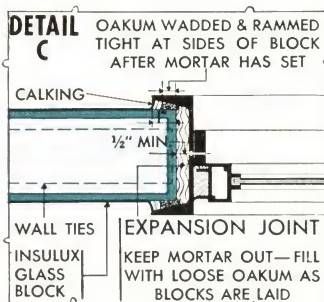
1/2" MIN.

WALL TIES

INSULUX
GLASS
BLOCK

EXPANSION JOINT

KEEP MORTAR OUT—FILL
WITH LOOSE OAKUM AS
BLOCKS ARE LAID



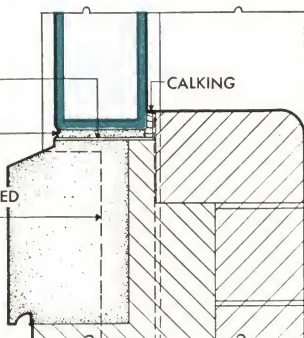
DETAIL-B

ASPHALT EMULSION

CALKING

MORTAR JOINT

5" CHANNEL ANCHORED
TO CONCRETE SLAB



DETAIL-D

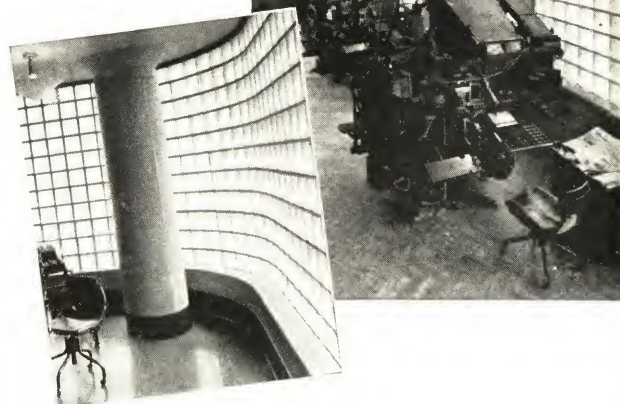
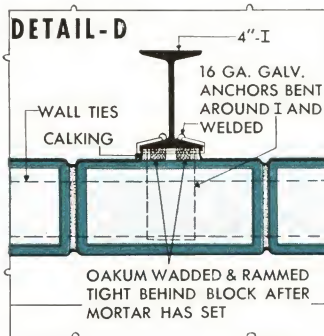
4" I

16 GA. GALV.
ANCHORS BENT
AROUND I AND
WELDED

WALL TIES

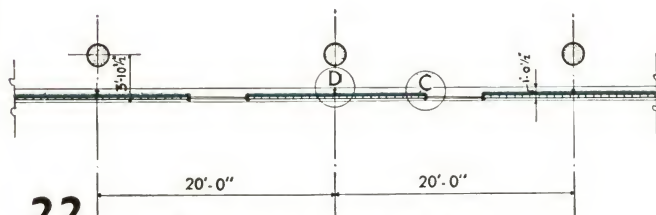
CALKING

OAKUM WADDLED & RAMMED
TIGHT BEHIND BLOCK AFTER
MORTAR HAS SET

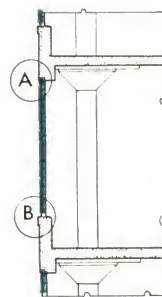


● The details on this page show a method for installing continuous glass block panels when sash are required for ventilation. The vertical structural channels used as window frames are continued to the lintel and form structural stiffeners and intermediate expansion joints for the glass block panels. (Detail C). Continuous channels (Detail A) provide horizontal anchorage and the necessary clearance for expansion at the head of the panels. Detail D is an intermediate stiffener located between window frames for the large panels on the second floor of the building. Bent plates may be substituted for channel frames when more than one-half inch clearance for expansion is necessary.

When continuous panels are not interrupted by windows, panels are to be stiffened by intermediate reinforcing members as shown on page 20, details 4, 5 and 7.

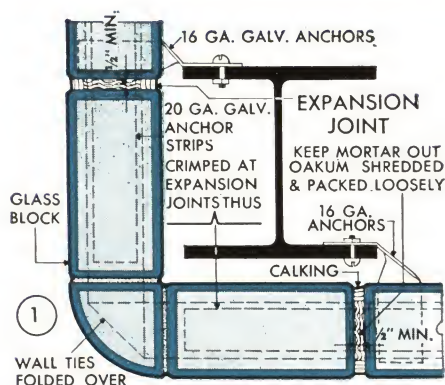


PLAN OF TYPICAL BAY

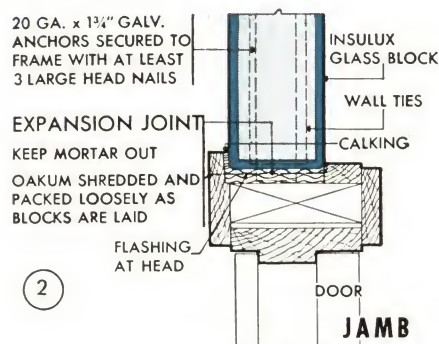


SECTION

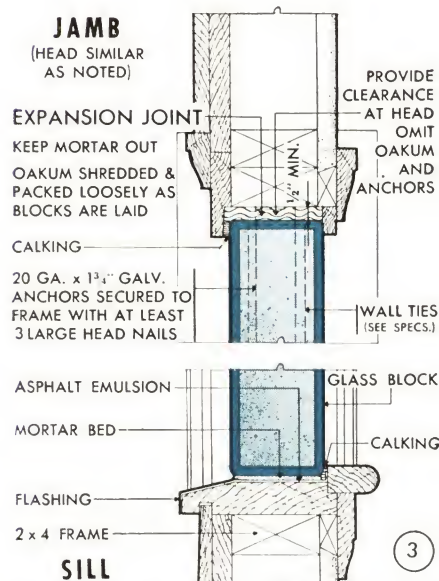
OWENS-ILLINOIS MISCELLANEOUS *Insulux* CONSTRUCTION DETAILS



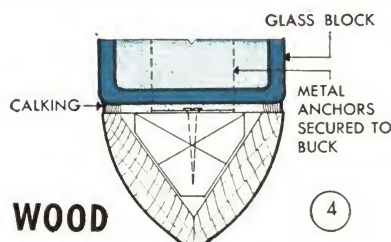
ANCHORING AT CORNER COLUMN



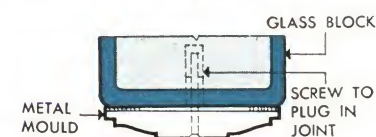
WOOD EXTERIOR DOOR FRAME



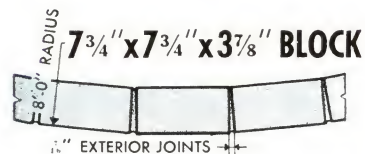
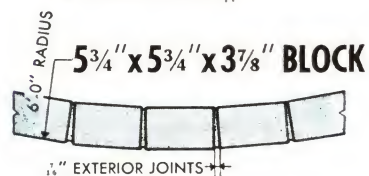
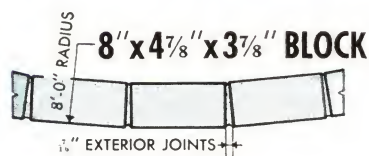
GLASS BLOCK IN WOOD FRAME CONSTRUCTION



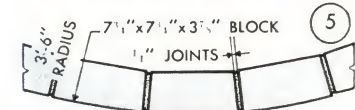
WOOD



TRIM FOR END OF BLOCKS

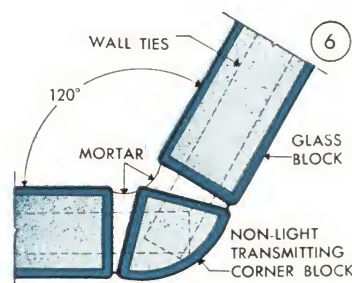


MINIMUM LAYING RADII FOR STANDARD BLOCK



LAYING RADIUS FOR 300-R

VARY JOINTS FOR OTHER RADII



120° CORNER

ANCHORAGE AT CORNER COLUMNS
A typical detail which can be adapted to continuous panel construction. It is important to keep block at least 1/2" from column.

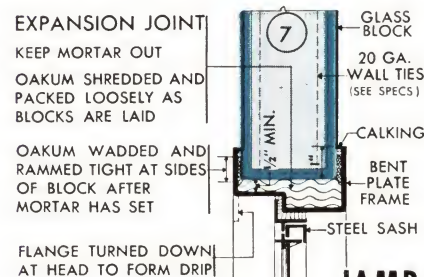
DETAILS FOR WOOD CONSTRUCTION
Insulux may be installed in frame buildings by much the same methods as used in other types of buildings. Wood sills should be covered with metal flashing before laying block. (Where panels are large lay block on steel plate or channel).

METAL EXTERIOR DOOR & WINDOW FRAMES
Door frames are to be securely anchored to building structure. Large windows set in exterior walls must be securely anchored to the building structure with provision for expansion at both jambs and sills.

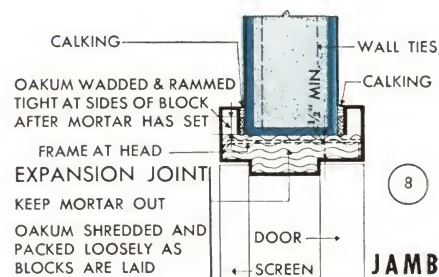
FOLLOW APPROVED METHODS

The details on this and preceding pages have been carefully worked out to assure the erection of Insulux under conditions and in a manner that will give the best results. These details are the result of experience with thousands of actual jobs under a great variety of conditions. Special care has been taken to provide complete information because Insulux has pioneered a new field and developed a new idea in building construction—the combining of light transmission, privacy, insulation value and architectural beauty in one material.

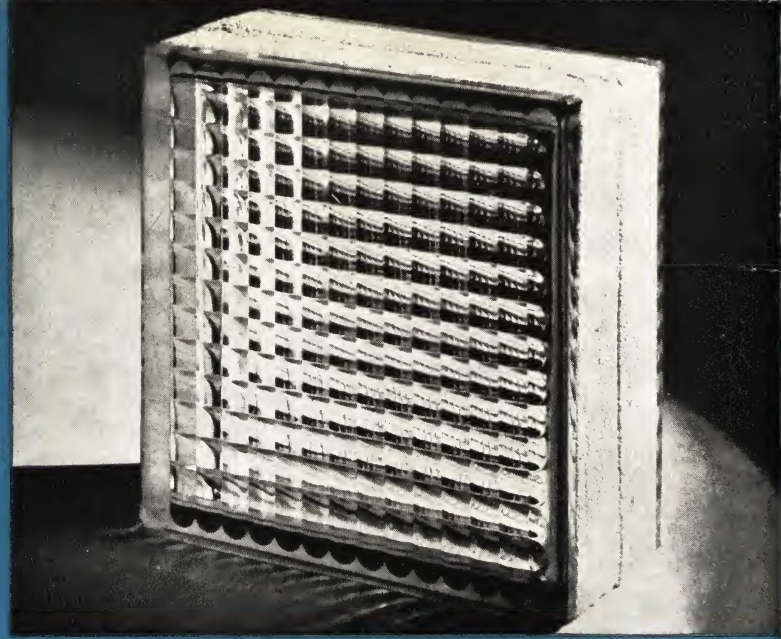
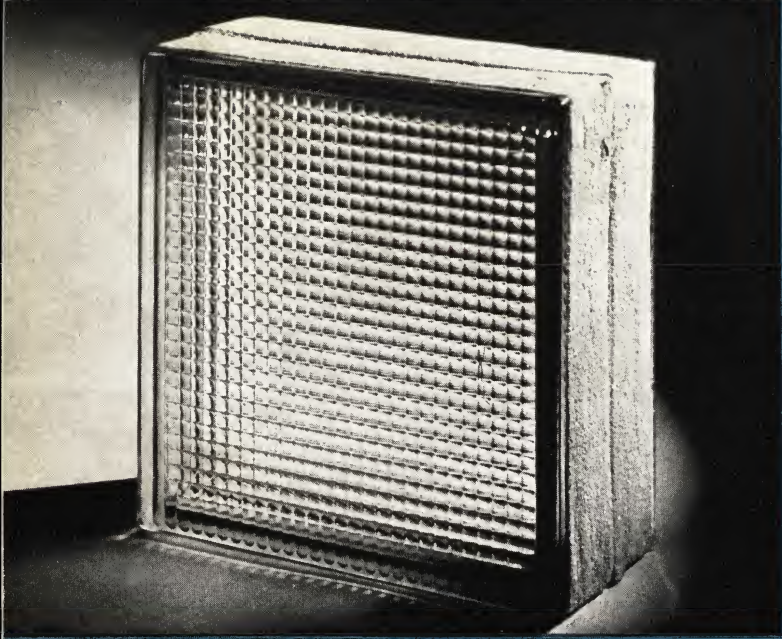
Therefore Owens-Illinois urges the adoption of specifications and details as shown in this book. Especially does it urge that good jobs demand proper expansion joints and that all panels be free from the compression or load of other materials at jambs and heads.



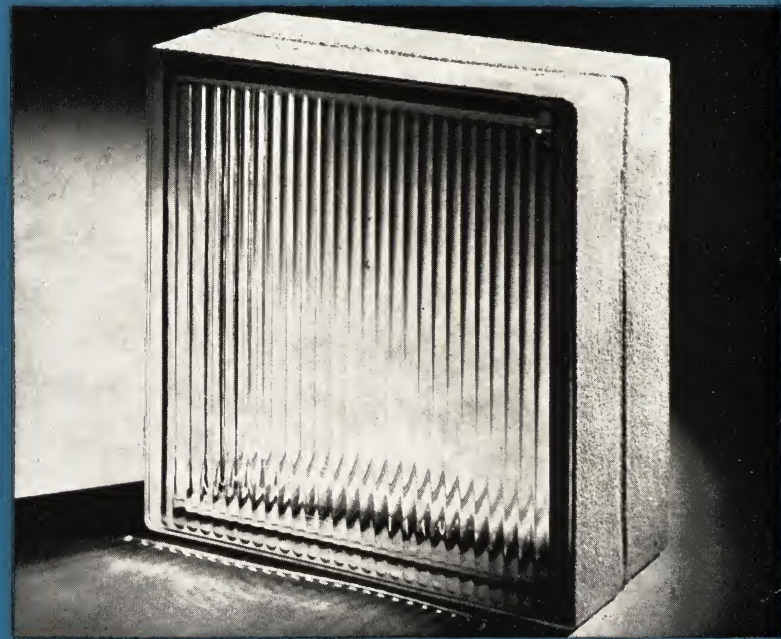
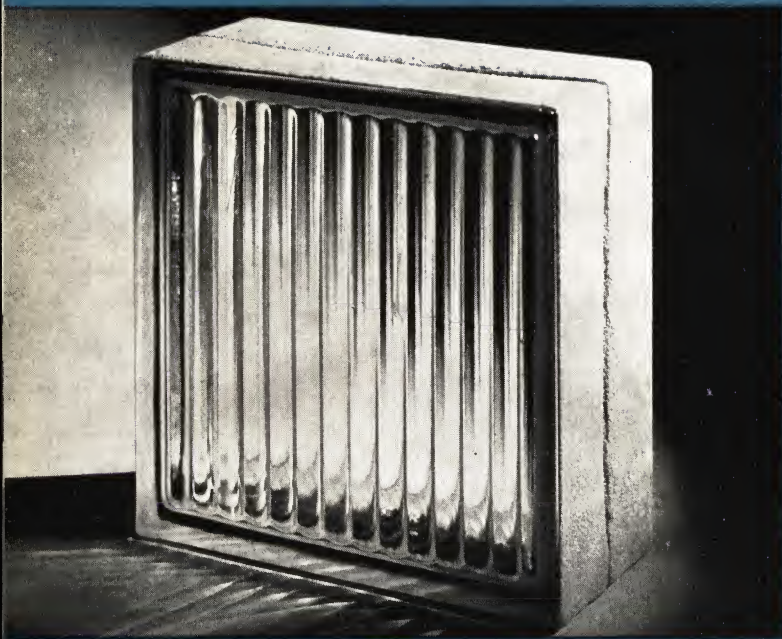
SUB-FRAME FOR STEEL SASH



METAL EXTERIOR DOOR FRAME



OWENS-ILLINOIS INSULUX



ADMITS LIGHT • RETARDS HEAT

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